STATE OF ILLINOIS
ILLINOIS COMMERCE COMMISSION

Northern Illinois Gas Company d/b/a Nicor Gas Company	))	08-0363
Proposed general increase in natural gas rates.	)	

DIRECT TESTIMONY OF CHRISTOPHER C. THOMAS ON BEHALF OF THE CITIZENS UTILITY BOARD

CUB Exhibit 1.0

August 27, 2008

ICC DOCKET NO. 08-0363
DIRECT TESTIMONY OF CHRISTOPHER C. THOMAS

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I. INTRODUCTION AND PURPOSE

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Christopher C. Thomas. My business address is 309 W. Washington St., Suite 800, Chicago, IL 60606.

Q. WHAT IS YOUR PRESENT OCCUPATION?

A. I am employed by the Citizens Utility Board ("CUB") as the Director of Policy. My duties include filing expert testimony before the Illinois Commerce Commission ("ICC" or "Commission") on CUB's behalf, development of CUB's policy positions, and management of the Policy Department.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS CASE?

A. I am testifying on behalf of CUB.

Q. PLEASE SUMMARIZE YOUR PROFESSIONAL EXPERIENCE.

A. My professional career includes more than eight years as a utility regulatory economist. I started my career as a regulatory economist in the Telecommunications Department of the Missouri Public Service Commission ("MoPSC"). While with the MoPSC, I filed testimony or affidavits in 11 different dockets. I became a CUB employee in September 2004, and have filed testimony before the ICC in numerous dockets. CUB Exhibit 1.01, attached to this testimony, is a list of the dockets in which I have filed testimony and a brief description of the nature of each docket.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND.

A. I have a Bachelor's degree in Business Administration with a concentration in Finance and a minor in Economics from Truman State University, and a Master's degree in Economics and Finance from Southern Illinois University, Edwardsville.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to present my analysis of the appropriate cost of equity capital for Nicor Gas Company ("Nicor" or "the Company").

Q. PLEASE SUMMARIZE YOUR FINDINGS.

A. The Commission has traditionally relied upon a cost of equity estimation methodology that focuses heavily on the Capital Asset Pricing Model, or CAPM. I conclude through an empirical analysis, supported by recent academic findings, that the CAPM is inappropriate for use in setting rates for regulated utilities. Further, I conclude that both the methodology adopted by Nicor's cost of equity witness, Mr. Makholm, and the Commission's conventional methodology of estimating the cost of common equity result in an overstatement of the cost of common equity. Although the Commission has previously rejected the academic evidence addressed herein regarding the invalidity of the CAPM as unpersuasive, my testimony in this proceeding introduces the results of a detailed empirical analysis, which the Commission has not reviewed before. This analysis clearly and unambiguously supports the findings in the academic literature. Specifically, current academic research regarding the Capital Asset Pricing Model ("CAPM") indicates that it is an inappropriate model for use in regulatory proceedings. In addition, there are facts specific to the record in this proceeding that requires the Commission to take a different look at the ROE calculation methodology on which the Commission has previously relied.

My testimony demonstrates that the company should receive a rate of return on common equity of no more than 9.455%. I also recommend that the Commission approved rate of return be reduced by 58 basis points if Nicor's proposed cost recovery riders are adopted.

II. ESTIMATING THE COST OF EQUITY

Q. WHAT IS THE COST OF EQUITY?

A. Generally, a company's cost of equity is the return on investment in the company that investors demand to choose this investment over other available investment options. The Company needs to generate fair returns for investors in order to maintain access to capital on reasonable terms. Because this return is recognized as a cost of doing business for the Company, the terms "cost of equity" ("COE") and "return on equity" ("ROE") are often used interchangeably by analysts.

Q. WHAT CRITERIA SHOULD THE COMMISSION USE TO DETERMINE AN APPROPRIATE COST OF EQUITY?

A. Two key U.S. Supreme Court decisions established the framework used to determine an appropriate, or fair, cost of equity for regulated companies. The first is *Bluefield Water Works & Improvement Co. v. Public Service Commission of West Virginia,* 262 U.S. 679, 692 (1923) ("*Bluefield*"). The second is the *Federal Power Commission et. al. v. Hope Natural Gas Co.,* 320 US 591 (1944) ("*Hope*"). Together, the *Bluefield* and *Hope* decisions establish that utilities are entitled to the opportunity to earn a fair return on their prudent and reasonable investment that is commensurate with the returns earned by other firms of comparable risk. The Commission's task is to ensure that the cost of equity, which is used to develop rates, compensates investors for their investment risk, while assuring that customers do not pay an excessive or unreasonable return in those rates.

The Commission should base its determination of a fair return on the relative riskiness of regulated companies, recognizing that the measure of a fair return will change over time as the fundamentals of the equity markets change and evolve.

Q. WHAT COSTS OF EQUITY HAS THE COMPANY REQUESTED IN THIS CASE?

A. According the testimony and Schedules of Dr. Jeff D. Makholm, Nicor Gas Ex. 10.0, the Company is requesting an 11.05% rate of return on common equity.

Q. PLEASE DESCRIBE DR. MAKHOLM'S ANALYSIS.

A. Dr. Makholm bases his analysis on alternative versions of the discounted cash flow ("DCF") model and the capital asset pricing model ("CAPM"). My testimony will address these methods and their application by Nicor and Dr. Makholm. As I will explain, Dr. Makholm's recommended cost of equity for Nicor is overstated. Additionally, his analysis incorrectly further inflates the results by incorporating previously rejected adjustments for selling and issuance expense.

Q. HOW HAS THE COMMISSION TRADITIONALLY DETERMINED THE COST OF COMMON EQUITY FOR ILLINOIS UTILITIES?

A. For a number of years, the Commission and Staff have relied on an analysis that averages the results of two financial models, the DCF and CAPM, giving equal weight to each. Dr. Makholm's analysis follows this same general structure.

Q. DOES AVERAGING THE RESULTS FROM THE CAPM AND DCF MODEL PRODUCE A REASONABLE ESTIMATE OF THE ROE?

A. No. As I will discuss below, I have performed a detailed empirical analysis which demonstrates that the CAPM the Commission has traditionally relied upon, the same model proposed by Dr. Makholm in this proceeding, is upwardly biased. Specifically,

the CAPM traditionally utilized by the Commission produces ROE estimates that exceed the cost of capital.

II.A. THE CAPITAL ASSET PRICING MODEL

Q. PLEASE DESCRIBE THE CAPM MODEL.

A. The CAPM is an analytical tool commonly used to estimate investors' required rate of return, which is equivalent to the cost of equity capital for a company. The CAPM can be represented by the following equation:

$$k = R_f + B(R_m - R_f)$$

where:

- k = Investors' required rate of return, or the cost of equity capital
- R_f = The risk-free rate of return
- B = Beta, a representation of the relative correlation between the market and the security or industry being analyzed, where 1.0 is perfect correlation
- R_m = The market return
- $(R_m - R_f)$ = The expected market risk premium ("EMRP"), or the market return in excess of the risk-free rate.

The CAPM formula is relatively simple. For a utility, the investors' required rate of return is the risk-free rate plus the value of the non-diversifiable risk that investors assume by investing in the utility. Non-diversifiable risk is essentially the risk that is inherent in the marketplace, as measured by the EMRP. The beta coefficient measures the amount of this non-diversifiable risk, also called market risk, to which investors are exposed by their investment.

Q. ARE THERE SPECIFIC INPUTS TO THE CAPM THAT ARE PARTICULARLY DIFFICULT TO ESTIMATE?

A. Yes. The beta parameter has long been a topic of debate in the academic literature. In applying the CAPM to determine regulated utility ROEs, the Commission has

traditionally relied upon a methodology that requires an adjustment to the beta coefficient. As I will discuss below, this adjustment is not appropriate for regulated utility companies because it overstates the cost of capital.

II.A.1. THE BETA PARAMETER IN THE CAPM MODEL

Q. WHAT DOES BETA REPRESENT IN THE CAPM?

A. The beta coefficient (b) represents the degree to which the price of a stock moves with the overall market. That is, it quantifies the volatility of an individual stock compared to the volatility of the market. A beta of 1.0 represents a stock that moves in complete unison with the overall market, and therefore has exactly the same risk as the overall market. If the beta is less than 1.0, then the stock is less volatile than the overall market, indicating that returns are more stable and presumably less risky. If the beta is greater than 1.0, then the stock is more volatile than the overall market, which indicates that the price changes more dramatically than prices in the overall market and the stock is riskier than the market.

Q. WHAT MEASURE OF BETA HAS THE COMMISSION TRADITIONALLY USED IN APPLYING THE CAPM?

A. The Commission has traditionally adjusted beta using a method commonly referred to as the mean reversion adjustment. The mean reversion adjustment is also used by Value Line, one of the largest research houses that provides information and analysis to investors, in calculating published beta estimates.

Q. PLEASE DESCRIBE HOW VALUE LINE BETAS ARE ADJUSTED BEFORE PUBLICATION.

A. After the raw beta measure is calculated from historical data, Value Line adjusts betas "...for their long-term tendency to converge toward 1.00."[1] Value Line computes raw beta estimates from a regression equation that measures the beta.[2] Then, Value Line adjusts the beta closer to 1.0 by using the following equation, which is referred to as a mean reversion adjustment:[3]

Adjusted beta = 2/3 x Unadjusted beta + 1/3 x 1.0

or

Unadjusted beta = Adjusted beta x 3/2 – 1/2

Q. IS SUCH AN ADJUSTMENT APPROPRIATE FOR UTILITY COMPANY BETAS?

A. No. The mean reversion adjustment is only proper when three key assumptions are true: (1) betas are unstable; (2) betas will eventually move to 1.0; and (3) the risk of the utility companies will eventually move toward the overall risk of other non-utility companies. As I will show below, these assumptions are not true for regulated utilities. Thus, since utility betas are typically below 1.0, the mean reversion adjustment has the effect of improperly increasing betas and the overall CAPM cost of equity.

Q. WHY IS THIS ADJUSTMENT INAPPROPRIATE FOR UTILITY COMPANIES?

A. The risk (beta) of utility companies has not been shown to move towards the risk (beta) of other non-utility companies. Essentially, their betas have not been shown to trend to a beta of 1.0. In fact, the financial literature demonstrates a contrary trend. I will also

[1] http://www.valueline.com/sup_glossb.html
[2] Beta is the covariance of a security to the market divided by the variance of the market.
[3] Cleveland S. Patterson, *The Cost of Capital: Theory and Estimation*, 130 (1995). Note that Merrill Lynch and Value Line don't use precisely 1/3 and 2/3 weighting.

present the results of a detailed empirical analysis which provides further definitive support to this conclusion.

Q. WHAT DOES THE FINANCIAL LITERATURE SAY ABOUT THE MEAN REVERSION ADJUSTMENT?

A. The mean reversion adjustment originated in a study in the 1970's conducted at the University of Pennsylvania's Wharton School of Business by Dr. Marshall E. Blume. After evaluating all common stocks listed on the New York Stock Exchange from 1926 to 1968, Dr. Blume concluded:

> There was some tendency for the estimated value of these risk measures [betas] to regress towards the mean [1.0] over time.[4]

Dr. Blume also found that correcting for this tendency resulted in more accurate betas. Because of these findings, most of the literature seems to accept that the adjustment is appropriate for companies with betas greater than 1.0. It seems intuitive that the risk of companies with high betas often moves towards 1.0 over time as companies learn their business and reduce their exposure to risk.

However, while the mean reversion may be appropriate for risky companies; it makes little sense for utility companies with betas below 1.0. After all, why would low-risk companies actively seek to make their operations *more* risky? For instance, in this case, the Company has proposed five different riders for the purpose of minimizing specific risks.

[4] Marshall E. Blume, On the Assessment of Risk, *The Journal of Finance*, 9 (Mar., 1971).

Studies performed on utility betas after the original Blume study have demonstrated that utility company betas do not trend toward 1.0. A well know study by Gambola and Kahl in 1990 concluded:

> The results of this study indicate that an underlying mean of 1.0 is too high for most utilities and an adjustment rate of .35 is too low.[5]

The literature demonstrates that the Commission's traditional assumption that utility company betas tend to revert to the market beta is inappropriate and overstates the beta parameter. This assumption introduces forecast error into the CAPM calculation and should be eliminated.

Q. CAN YOU PROVIDE AN EXAMPLE OF HOW THE MEAN REVERSION ADJUSTMENT OVERSTATES UTILITY COMPANY BETAS?

A. Yes. I have conducted a detailed empirical analysis of the companies in Dr. Makholm's sample of comparable natural gas and electric utilities. My analysis demonstrates that for the companies in the sample group, the beta adjustment methodology upon which the Commission has traditionally relied makes the CAPM less accurate and unnecessarily increases the cost of equity.

II.A.1.a TESTING THE BETA ADJUSTMENT METHODOLOGY

Q. HOW DOES YOUR ANALYSIS EXAMINE THE BETA ADJUSTMENT METHODOLOGY?

A. My analysis was designed to test the accuracy of the static beta adjustment methodology, traditionally accepted by the Commission, for the companies in Dr. Makholm's sample of comparable utilities.

[5] Michael J. Gambola and Douglas R. Kahl, Time Series Processes of Utility Betas: Implications for Forecasting Systematic Risk, Financial Management 92 (autumn, 1990).

As I discussed above, the mean reversion adjustment is based upon the research of Dr. Marshall E. Blume. Dr. Blume found that betas have some tendency to regress toward the mean over time. As discussed in CUB Ex. 1.0, this finding has been widely interpreted to imply that betas must be adjusted toward the market mean through a static (non-changing) adjustment. However, Dr. Blume actually found that:

> The coefficients [of Dr. Blume's regression equations] themselves do change overtime, so that the use of the historical rate of regression to correct for the future rate will not perfectly adjust the assessments and may even overcompensate by introducing larger errors into the assessments than were present in the unadjusted data. [6]

This suggests that a static mean reversion adjustment may actually introduce larger error into CAPM results than using unadjusted betas. My analysis was designed to test this proposition for a sample of utility companies.

Q. PLEASE DESCRIBE YOUR ANALYSIS.

A. I began by calculating estimates of beta for each company in each month during the period from April 1995 through August 2008. Using differing measures of return on each individual security and the overall market, I compared the risk free rate implied by the model to the prevailing risk free rate. I focused on the risk free component of the CAPM because it is readily observable, and has traditionally not been the subject of significant debate. Because of this, I was able to test the validity of the CAPM under a variety of assumptions. These assumptions focus on varying measures of both market return and the return on each individual security.

[6] Marshall E. Blume, On the Assessment of Risk, *The Journal of Finance*, 8-9 (Mar., 1971).

Q. PLEASE DESCRIBE THE FORM OF THE CAPM MODEL USED IN YOUR ANALYSIS

A. I began by solving the traditional form of the CAPM, using simple algebra, for the risk free rate through the following transformation:

$$k = Rf + b\,(Rm-Rf)$$

$$k = Rf + bRm - bRf$$

$$k - bRm = Rf - bRf$$

$$k - bRm = Rf\,(1-b)$$

$$Rf = (k - bRm) \,/\, (1-b)$$

The risk free rate (Rf) implied by the CAPM formula is the cost of equity (k) minus beta (b) multiplied by the market return (Rm) divided by one minus beta (1-b).

Q. HOW DID YOU MEASURE THE COST OF EQUITY (k)?

A. My analysis examined the actual annual returns earned on each security because the return on each stock is effectively the cost of equity capital for anyone holding the security. I examined returns earned simultaneously with each beta, and also earned both one-year and five-years after each beta was calculated. These three measures provide a balanced view of the cost of equity for each calculated beta.

Q. HOW DID YOU MEASURE THE RETURN ON THE MARKET?

A. I examined both the actual annual returns earned on the S&P 500, and analysts' forecasted rates of return on the S&P 500. I examined returns earned simultaneously with each beta, as well as those earned both one-year and five-years after each beta was calculated. In addition, I also examined the returns that analysts were forecasting for the

future during the period when each beta was calculated. These four measures provide a balanced view of market returns.

Q. HOW DID YOU MEASURE THE RISK FREE RATE OF RETURN?

A. In order to provide a balanced view of the risk free rate, I collected the returns for one month t-bills, 10 year t-bonds, and 20 year t-bonds from the Federal Reserve (http://www.federalreserve.gov/).

Q. HOW DID YOU CALCULATE BETA ESTIMATES?

A. I began by collecting monthly data measured on the first trading day of the month for the S&P 500 and each individual company in Dr. Makholm's sample of comparable utilities for the period from April 1990 to August 2008. Then I calculated the raw beta parameter over a rolling 60 month period[7]. This method produced 161 individual beta calculations for each of the eight (8) individual stocks from April 1995 to August 2008. After calculating raw beta estimates, I also calculated adjusted beta estimates using the mean reversion adjustment traditionally accepted by the Commission, and described above.

Q. HOW DID YOU TEST THE ACCURACY OF EACH ASSUMPTION?

A. Using the parameters I have described, I was able to compare the actual risk free rate of return to the risk free rate of return implied by the CAPM. I then analyzed the variance, or the difference, between each implied risk free rate of return and the actual risk free rate of return by calculating the sum of the squared errors (SSE). The SSE in this instance is the squared difference between each implied risk free rate and each actual risk free rate.[8] I then divided the SSE by the number of data points in each sample to calculate the Mean

[7] Beta is calculated as the covariance of the market and the individual stock, divided by the variance of the overall market.

[8] The differences are squared to make every data point positive, because the sum of two negative numbers is a positive number.

Square Error (MSE). This methodology allows the Commission to examine the relative magnitude of different test cases with one constant statistic. Quite simply, a test case with a larger MSE has missed the actual risk free rate by a greater amount, making it less accurate.

Q. WHAT ARE THE RESULTS OF YOUR ANALYSIS?

A. The following chart summarizes my results.

Testing the Beta Adjustment	Mean Squared Error (MSE)	
Test Case	**Unadjusted Beta**	**Adjusted Beta**
Annualized stock and S&P 500 Returns, to 20 yr Rf	0.0376	0.1649
Annualized stock and S&P 500 Returns, to 10 yr Rf	0.0653	0.1645
Annualized stock and S&P 500 Returns, to 30 day Rf	0.0616	0.1547
12 month forward annualized stock and S&P 500 returns to 20 yr Rf	0.1801	0.4889
5 year forward annualized stock and S&P 500 returns to 20 yr Rf	0.0132	0.0231
Annualized stock and forecasted S&P 500 returns to 20 yr Rf	0.3929	0.7670
5 yr forward stock and forecasted S&P 500 returns to 20 yr Rf	0.1586	0.5620

As the above chart demonstrates, for each test case that I examined, the beta adjustment methodology produced MSEs that are greater than the MSEs from unadjusted, or raw, betas. This demonstrates that for the sample companies the mean reversion adjustment introduces larger error into the results than using unadjusted beta alone.

Q. WHAT ARE THE IMPLICATIONS OF YOUR ANALYSIS?

A. Generally, my analysis supports the conclusion in the academic literature that the beta adjustment methodology is inappropriate for regulated utility companies. Specifically, it demonstrates that for the utilities in Dr. Makholm's sample of comparable utilities the mean reversion adjustment produces beta estimates that are less accurate than raw, or unadjusted, betas. This means that for the sample companies the mean reversion adjustment actually increases the inaccuracy of the CAPM.

In addition, this evidence also supports a set of broader conclusions about the usefulness of the CAPM. In the next section of my testimony, I will review the academic literature on this topic and explain how my findings for the sample companies indicate that the Commission cannot ignore this analysis.

II.A.1.b CURRENT ACADEMIC RESEARCH REGARDING THE CAPM AND ITS EFFECT ON THE COMMISSION'S DECISION

Q. PLEASE SUMMARIZE THE MOST CURRENT RESEARCH REGARDING THE CAPM.

A. In 2007, the Quarterly Journal of Business and Economics published a paper by Gregory L. Nagel, et. al. , entitled "The Effect of Risk Factors on Cost of Equity Estimation" (the "Nagel paper"). This paper compared a very simplified version of the CAPM to the version of the CAPM traditionally used by the Commission and five other well-known theoretical models that add more specific risk measurements (such as the factor loadings and expected risk premia mentioned in the following quote) to the traditional mainstream CAPM. The authors conclude:

> [F]orecast error caused by estimating factor loadings and expected risk premia in the more complex models exceeds the precision gained by including the risk factors. In other words, both parametric and nonparametric statistical tests show that increasing model complexity fails to significantly reduce forecast error.[9]

Q. WHAT IS FORECAST ERROR AND WHAT ARE THE IMPLICATIONS OF THE NAGEL PAPER'S FINDINGS ON THE CAPM TRADITIONALLY USED BY THE COMMISSION?

A. When referring to the cost of equity, forecast error refers to the difference between actual returns and forecasted returns. The Nagel paper rejects the version of the CAPM

[9] Gregory L Nagel, David R. Peterson, and Robert S. Prati, The Effect of Risk Factors on Cost of Equity Estimation, Quarterly Journal of Business and Economics, Vol. 46 No. 1, 61.

traditionally used by the Commission because it has a higher forecast error than the simplified version. Because of this forecast error, Nagel, et. al.'s, findings indicate that the Commission should reexamine the overall usefulness of the CAPM in rate-setting proceedings.

Q. HOW DOES THE NAGEL PAPER SIMPLIFY THE CAPM MODEL?

A. Nagel and his co-authors began their analysis by simplifying the two key drivers of CAPM results, the beta and expected market risk premium. The authors first made the unrealistic assumption that the same cost of equity is applicable to all stocks at any time. That is, by setting the beta coefficient equal to 1.0, they assume that the CAPM model produces the same cost of equity results for every individual stock, and thus any portfolio of stocks. Second, the authors simplified the calculation of the expected market risk premium (EMRP) to calculate only the actual realized return on the market relative to the risk free rate[10], instead of the traditional method of calculating the average return over the period relative to the risk free rate.

The effect of Nagel, et. al.'s, simplifying assumptions is to produce a model that estimates the same cost of equity for every stock in any time period. The authors compared the forecasted results of this simplified model to actual data points to calculate a baseline forecast error. Then, to determine if the more complicated versions of CAPM result in more accurate analysis, they compared this baseline error to the forecast error which results from the more complicated versions of the CAPM.

[10] The actual realized return over the risk free rate was then fixed for specific index periods.

Q. HOW DID THE TRADITIONAL VERSION OF THE CAPM COMPARE TO THE SIMPLIFIED VERSION?

A. The simplified version outperformed every other studied model, including a traditional version which relies on unadjusted or raw betas, for every forecasted time period longer than one month. This finding, that an overly simplified, unrealistic version of the CAPM outperforms the traditional version, casts serious doubt on the usefulness of the CAPM model.

Q. HOW DOES THE TRADITIONAL VERSION OF THE CAPM USED IN THE NAGEL PAPER COMPARE TO THE VERSION HISTORICALLY USED BY THE COMMISSION?

A. The analysis in the Nagel paper does not use adjusted betas. In contrast, the Commission has typically adjusted betas for regulated utilities upwards. Academic research indicates that this adjustment is inappropriate for regulated utility companies, and results in an overstated cost of equity. The detailed empirical study introduced above, provides further definitive support to this research. Thus, the Nagel paper rejects a version of the CAPM that is more accurate than the model traditionally relied on by the Commission.

Q. IS NAGEL ET. AL.'s FINDING CONSISTENT WITH PAST ACADEMIC RESEARCH?

A. Yes. Ravi Jagannathan and Iwan Meier discussed a number of theoretical problems with the CAPM in their 2002 article "Do We Need CAPM for Capital Budgeting:"

> The CAPM as a model has been seriously challenged in the academic literature.... [S]ince the critique by Fama and French (1992) there is consensus in the academic literature that the CAPM as taught in MBA classes is not a good model – it provides a very unreliable estimate of the cost of capital.... [T]here is overwhelming evidence in the academic literature that business schools have been teaching a model that may not be of much value when it comes to estimating the cost of capital for a project.[11]

[11] Ravi Jagannathan and Iwan Meier, Do We Need CAPM For Capital Budgeting?, Financial Management, 5, 7, 10 (Winter 2002).

Q. HAS THE COMMISSION PREVIOUSLY ADDRESSED THIS RESEARCH?

A. Yes. However, the Commission has misinterpreted the evidence and incorrectly concluded in its Final Order in Docket No. 07-0507 that the research actually supports its longstanding practice of relying on adjusted betas in the CAPM, and the CAPM model itself, to determine the ROE.

In its final order in ICC Docket No. 07-0507, the Commission found:

> CUB witness Thomas states, "[t]he version of the CAPM traditionally used by the Commission was rejected by the Nagel paper because it had a higher forecast error than the more simplified version." (CUB Ex. 1.0 at 5) While the parties seem to agree that in the Nagel Paper raw or unadjusted betas were used in the CAPM, other than Mr. Thomas' statement, there is no indication that adjusted betas were excluded from the Nagel Paper due to forecast error. There is simply no support in the record for what appears to be an assumption by Mr. Thomas and CUB that a simplified version of the CAPM, where all betas equal 1.0, would have a lower forecast error than the traditional CAPM if adjusted betas had been used. Based upon its review of the record, the Commission is inclined to agree with Staff that logically, if anything, the fact that the Nagel Paper found using a simplified CAPM, where the beta of all stocks is set equal to 1.0, is superior to the use of unadjusted betas would tend to support using adjusted rather than unadjusted betas.
>
> In summary, the Commission does not believe that the Nagel Paper, as discussed in the record of this proceeding, undermines the usefulness of the CAPM in establishing the market required rate of return in utility rate cases. In fact, as discussed above, the Commission believes the Nagel Paper tends to support the long-standing proposition to which the Commission has subscribed: that the use of adjusted betas in the CAPM is preferable to the use of unadjusted betas.

Q. HOW DOES THE EVIDENCE YOU HAVE PRESENTED UNDERMINE THE COMMISSION'S DETERMINATION REGARDING THE NAGEL PAPER?

A. The Commission concluded that the Nagel paper supports the conclusion that adjusted betas are preferable to unadjusted betas. However, as I have shown, for the companies in Dr. Makholm's sample of comparable utilities, the beta adjustment methodology actually results in less accurate beta estimates which cannot be relied upon by the Commission. When this evidence is viewed in concert with the findings of Nagel, et, al., it is clear that the Commission cannot rely upon the CAPM model as a determinant of Nicor's ROE.

II.A.2 APPLYING MY FINDINGS TO THE CAPM MODEL

Q. IF THE COMMISSION DETERMINES THAT THE CAPM REMAINS APPROPRIATE TO USE IN SETTING RATES, HOW CAN IT IMPROVE THE ANALYSIS?

A, If the Commission rejects my testimony, and determines that the CAPM should be used as a determinant of Nicor's return, then it must only rely on a CAPM analysis that does not utilize adjusted betas.

Q. WHAT EFFECT DOES REMOVING THE BETA ADJUSTMENT HAVE ON DR. MAKHOLM'S CAPM ANALYSIS?

A. Removing the beta adjustment reduces Dr. Makholm's CAPM results as shown in the following table:

Makholm CAPM Methods with Beta Adjustment Removed

Sample Group		Value Line Beta*	Unadjusted Beta**	Makholm Method 1	Makholm Method 2		Makholm Method 1 w/ unadjusted beta	Makholm Method 2 w/ unadjusted beta
Piedmont Natural Gas	4.31%	0.85	0.775	10.31%	6.55%		12.30%	9.39%
Northwest Natural Gas	4.31%	0.9	0.85	10.31%	6.55%		13.07%	9.88%
Southwest Gas	4.31%	0.9	0.85	10.31%	6.55%		13.07%	9.88%
Nicor	4.31%	1	1	10.31%	6.55%		14.62%	10.86%
Vectran Corp.	4.31%	0.9	0.85	10.31%	6.55%		13.07%	9.88%
Avista Corp.	4.31%	1	1	10.31%	6.55%		14.62%	10.86%
MGE Energy	4.31%	0.95	0.925	10.31%	6.55%		13.85%	10.37%
Wisconsin Energy	4.31%	0.85	0.775	10.31%	6.55%		12.30%	9.39%
					Average CAPM			
					Average of 1 and 2			11.71%
					Makholm proposed CAPM			
					Effect of Beta Adjustment			0.39%

Notes

* Nicor Gas Ex. 10.14

** Adjustment removed with: Adjusted Beta * (3/2) - 1/2

*** Market risk premiums are from Nicor Ex. 10.14 with Issuance Expense adjustments removed

Dr. Makholm calculated two different CAPM estimates, using two different measures of the market risk premium. The drastic difference, 330 basis points (13.36% - 10.06% = 3.30%), between his two chosen measures only serves to further highlight the inaccuracy of the CAPM model, and supports my conclusion that the CAPM is not a reliable model for use in determining Nicor's ROE.

II.B. THE DCF MODEL

Q. PLEASE DESCRIBE THE DCF MODEL.

A. The DCF, or discounted cash flow model, is the other primary methodology that the Commission has relied on to calculate the cost of equity for regulated utilities in Illinois. The DCF model estimates the cost of equity capital by assuming that investors who purchase stock are paying a price that reflects the present value of the cash flows they expect to receive from the stock in the future. Using information about the current stock price and expected future cash flows from dividend payments and earnings growth, the model estimates the return that investors expect to receive on their investment.

The DCF model is based on two fundamental financial principles. First, the current market price of a financial asset, such as a share of common stock or equity, is equal to the present value of all future cash flows that investors expect to receive from the asset. All cash flows to investors come from either future dividends or the sale of the stock. This means that the rate of return investors require for the risk they take in their investment is the rate at which the present value of all future cash flows from an asset are equal to the current market price of the asset.

The second basic financial principle is the time value of money. In its most basic form, this principle provides that a dollar received today is more valuable than a dollar received at some point in the future. The present value of a dollar received today is higher because an investor could realize a return in future periods by investing the dollar. If the investor receives that dollar in the future, she will have missed the opportunity to invest today.

Thus, the present value of the dollar received at some point further in the future is lower. The investor's required rate of return, or a company's cost of capital, is the rate of return that makes the present value of a dollar received at some point in the future equal to the value of a dollar received today.

Q. WHAT FORM OF THE DCF MODEL DOES THE COMMISSION TRADITIONALLY RELY UPON?

A. For years, the Commission has relied upon the constant growth or "Gordon" DCF model, which can be represented by the following equation:

$$k = D_0(1+g)/ P_0 + g$$

Where:

k = Investors required "rate of return", or the "cost of equity capital"
D_0 = The current dividend payment
g = The expected sustainable growth rate
P_0 = The current stock price
$D_0(1+g)/ P_0$ = The expected dividend yield

The Commission has traditionally adjusted this model for the quarterly timing of dividend payments. While I believe that this methodology overstates the cost of equity, as I have testified in several of the last rate proceedings[12], I am not taking issue with it in this proceeding.

It is worth noting that in recent cases, the Commission has strayed from the constant growth model in favor of multi-stage DCF models. In Docket No. 07-0507, the Commission explicitly considered a two-stage DCF model in setting an approved rate of return for Illinois American Water Company, Docket No. 07-0507 Final Order at 92. This type of multi stage DCF model assumes different growth rates at points in time. In

[12] See CUB Ex. 1.0 in Docket Nos. 07-0242, 07-0507, 07-0566, and 07-0585

accepting multi-stage models, the Commission has determined that analyst's growth rates have not been sustainable in some circumstances, a point which I will discuss below. See Docket No. 07-0507 Final Order at 89 and 92.

Q. HAVE YOU EXAMINED THE DCF ANALYSIS PRESENTED BY DR. MAKHOLM IN THIS PROCEEDING?

A. Yes. I have examined Dr. Makholm's DCF analysis and have observed two problems with his analysis. First, Dr. Makholm has inappropriately included adjustments for selling and issuance expense in his results. His proposal is inconsistent with prior Commission practice, and he has presented no evidence that could cause the Commission to change its practice. Second, he has calculated inappropriate, and upwardly biased sustainable growth rates for use in his analysis.

II.B.1.SELLING AND ISSUANCE EXPENSE

Q. WHAT IS SELLING AND ISSUANCE EXPENSE?

A. Selling and issuance expense refers to the costs that a company incurs when it issues new common equity.

Q. HAS THE COMMISSION PREVIOUSLY ADDRESSED THIS ISSUE?

A. Yes. In its Final Order in Nicor's last general rate case, Docket No. 04-0779 (page 94), the Commission found that:

> Nicor's burden was to introduce into the record persuasive evidence that the issuance costs sought for recovery had actually been incurred in the specific amount being requested *and* that those costs have not been previously recovered through rates. The Commission finds they have fallen short in this regard....
>
> In short, the Commission finds that the documentation presented by the Company is inconclusive in establishing that issuance costs remain unrecovered. Nicor has not met its burden and, therefore, is

not entitled to the recovery of any flotation costs in this proceeding.

As Staff noted in that docket, the Commission has reached the same conclusion in the prior two general rate case proceeding filed by Nicor. See pages 90 and 91of the Final Order in Docket No. 04-0779 Final Order.

Q. HAS DR. MAKHOLM INTRODUCED ANY EVIDENCE TO MEET THE BURDEN ARTICULATE IN THE COMMISSION'S 04-0779 FINAL ORDER?

A. No. Dr. Makholm has not demonstrated that the amounts being requested have actually been incurred. In addition to not demonstrating that the proposed Nicor specific amounts were actually incurred for the sole benefit of Nicor gas, and not any affiliated interests, Dr. Makholm proposes to include estimated selling and issuance expense costs that have explicitly not been incurred by Nicor Gas. See Nicor Ex. 10.12 at note 3. This is clearly inappropriate.

Q. WHAT EFFECT DOES THE REMOVAL OF SELLING AND ISSUANCE EXPENSE HAVE ON DR. MAKHOLM'S DCF RESULTS?

A. As shown on Dr. Makholm's Ex. 10.13, removing his inappropriate selling and issuance expense adjustment reduces his DCF result by 18 basis points, from 10.01% to 9.83%.

II.B.2 SUSTAINABLE GROWTH RATE

Q. WHAT DOES THE GROWTH COMPONENT OF THE DCF MODEL REPRESENT?

A. The growth rate in the DCF model represents the sustainable growth that investors expect from their investment in the company. Growth is traditionally measured in three different ways, each of which has a special significance to investors. First, the most easily understandable measure is the overall growth in earnings, or the growth in the company's

revenues that are available to either pay investors or reinvest in the company. Second, growth can be measured in dividends, or the revenue that the company actually pays to investors. Third, fundamental growth relies on the growth in retained earnings, or earnings used by management to fund operations and to expand the business by investing in new facilities or more efficient processes that will produce greater future returns. This type of growth is known as "fundamental" growth because it comes from the capital retained within the business. In addition, each of these measures of growth can be based upon either analysts' expectations of the future, or historic performance.

Q. HOW DID DR. MAKHOLM CALCULATE THE SUSTAINABLE GROWTH RATE?

A. Dr. Makholm's proposed 5.82% sustainable growth rate is based upon three different measures of growth. Dr. Makholm collected analysts' estimates from both Value Line and Zacks and also performed a fundamental growth rate calculation.

Q. DO YOU HAVE ANY CONCERNS WITH HIS METHODOLOGY?

A. I have two concerns with his methodology. First, the academic evidence is very clear that analysts' estimates of sustainable growth rates are overly optimistic and do not accurately represent expected sustainable growth. Second, I have concerns with the fundamental growth estimate proposed by Dr. Makholm.

Q. WHAT DOES THE FINANCIAL LITERATURE SAY ABOUT THE USE OF ANALYSTS' FORECASTED GROWTH RATES TO CALCULATE THE EXPECTED SUSTAINABLE GROWTH RATE?

A. The current financial literature reveals that forecasting future growth rates is difficult. Analysts tend to be optimistic about future growth and produce forecasts that are upwardly biased. This upward bias translates into DCF cost of capital estimates that are

above the true required cost of capital. The following quotations express some of these findings.

In their 2005 text titled "Valuation: Measuring and Managing the Value of Companies," Tim Koller, Marc Goedhart and David Wessels state that:

> ...many argue that analyst forecasts focus on the short term and are severely upward biased.[13]

Dr. Enrique Arzac comments on the difficulty of forecasting growth rates and the impact that using these forecasts has on DCF model results:

> The problem with [the DCF] approach is that the long-term dividend growth rate of an individual company cannot be estimated with any degree of precision. Hence, the dividend growth model is not likely to produce reliable estimates of the cost of equity capital of individual companies.[14]

Further Dr. Arzac adds,

> A number of empirical studies have documented optimistic bias in analysts' earnings forecasts....Thus, it seems reasonable to conclude that [the DCF equation] yields an upper bound to the equity premium.[15]

Claus and Thomas conclude that earnings and dividend growth rates traditionally used for the DCF model:

> ...exhibit substantial optimism bias and need to be adjusted downward.[16]

Finally, Fama and French state that:

> beyond two years, the best forecast of earnings growth is the historical average growth rate.[17]

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[13] Tim Koller et al., Valuation: Measuring and Managing the Value of Companies 305 (2005)..
[14] Enrique Arzac, Valuation for Mergers, Buyouts, and Restructuring, John Wiley and Sons, 42 (2005)..
[15] Enrique Arzac, Valuation for Mergers, Buyouts, and Restructuring, John Wiley and Sons, 44 (2005)..
[16] James Claus and Jacob Thomas, Equity Premia as Low as Three Percent?, 56 J. Finance 1662 (Oct. 2001).
[17] Eugene F. Fama and Kenneth R. French, The Equity Premium, 57 J. Finance 651 (April 2002).

The literature is clear about the bias inherent in analysts' growth forecasts. However, the Commission has traditionally accepted such forecasts as the sole determinant of growth. If the Commission is going to rely on analysts' forecasts, it must not use them as the sole determinant. The Commission can, as Dr. Makholm recommends, balance analysts' views with measures of historic growth. While I believe this is a suboptimal approach, it is preferable to relying solely on analysts forecasts.

II.B.2.a FUNDAMENTAL GROWTH

Q. WHAT IS FUNDAMENTAL GROWTH?

A. Fundamental growth, which Dr. Makholm refers to as retention growth or sustainable growth, divides growth into two distinct components. These two components are internal growth, or the growth that occurs through the capital retained within the business and external growth, or growth from injecting capital into the business through external financing sources

Q. WHAT ARE YOUR CONCERNS WITH DR. MAKHOLM'S FUNDAMENTAL GROWTH ANALYSIS?

A. Dr. Makholm's fundamental growth methodology incorporates an adjustment for the issuance and sale of new common stock, which is referred to as external growth. Such an adjustment is simply not appropriate for regulated public utilities such as Nicor.

As I mentioned above, the fundamental growth methodology often incorporates measures of both internal and external growth. The internal growth method, sometimes referred to as the B * R method, estimates the maximum level of growth that a company can sustain

without injecting more capital into the business. The external growth method, sometimes referred to as the S * V method, measures any external capital injected into the business.

For regulated utilities, absent concrete plans to issue new common stock in the regulated entity, it is inappropriate to incorporate measures of external financing. This is completely consistent with the Commission's practice of granting regulated utilities a return on only their prudent and reasonably incurred investments during the test year (along with any approved pro forma adjustments).

In addition, Dr. Makholm has not shown that access to additional capital will somehow be impaired by looking only at internal growth. Additionally, if the Commission approves the Company's Proposed Rider QIP proposal, the riskiness of some future capital investments declines substantially, so the Company will not be raising capital on the same terms that it has been in the past. This will reduce the Companies' overall cost of capital.

II.B.3 DCF RESULTS

Q. WHAT IS THE EFFECT OF REMOVING BOTH DR. MAKHOLM'S PROPOSED ADJUSTMENTFOR SELLING AND ISSUANCE EXPENSE AND HIS INNAPPROPRIATE ADJUSTMENT FOR THE ISSUANCE OF NEW EQUITY ON DR. MAKHOLM'S DCF ANALYSIS?

A. Removing Dr. Makholm's inappropriate adjustment for the issuance of new stock in the fundamental growth rate formula reduces the sustainable growth rate by 36 basis points as shown in the following chart:

Growth Rates

Sample Group	B*R*	Value Line Growth**	Zacks Growth**	
Piedmont Natural Gas	3.50%	4.73%	5.50%	4.58%
Northwest Natural Gas	4.40%	7.03%	5.30%	5.58%
Southwest Gas	7.58%	5.60%	N/A	6.59%
Nicor	4.60%	NMF	4.00%	4.30%
Vectran Corp.	3.33%	7.32%	4.70%	5.12%
Avista Corp.	3.61%	3.55%	5.00%	4.05%
MGE Energy	6.41%	4.77%	N/A	5.59%
Wisconsin Energy	7.05%	7.27%	9.40%	7.91%
Average	5.06%	5.75%	5.65%	5.46%
			Makholm Proposal**	5.82%
			Difference	-0.36%

Notes

* From Nicor Ex 10.9

** From Nicor Ex 10.11

Using this 5.46% growth rate in the DCF model, and eliminating Dr. Makholm's proposed adjustment for selling and issuance expense, produces a rate of return on Common Equity of 9.455% as shown below.

QUARTERLY DISCOUNTED CASH FLOW ANALYSIS

Sample Group	Adjusted Stock Price*	Q1*	Q2*	Q3*	Q4*	g	Qf1	Qf2	Qf3	Qf4	Quarterly Dividend Yield	DCF
Piedmont Natural Gas	$24.21	0.25	0.25	0.25	0.25	4.58%	0.26	0.26	0.26	0.26	4.46%	9.040%
Northwest Natural Gas	$46.34	0.36	0.36	0.36	0.38	5.58%	0.37	0.37	0.37	0.40	3.46%	8.964%
Southwest Gas	$27.95	0.21	0.22	0.22	0.22	6.59%	0.22	0.23	0.23	0.23	3.46%	9.949%
Nicor	$39.67	0.47	0.47	0.47	0.47	4.30%	0.48	0.48	0.48	0.48	5.10%	9.359%
Vectran Corp.	$26.93	0.32	0.32	0.32	0.33	5.12%	0.33	0.33	0.33	0.34	5.21%	10.259%
Avista Corp.	$19.40	0.15	0.15	0.15	0.15	4.05%	0.15	0.15	0.16	0.16	3.29%	7.302%
MGE Energy	$32.28	0.35	0.35	0.36	0.36	5.59%	0.37	0.37	0.37	0.37	4.86%	10.363%
Wisconsin Energy	$44.80	0.25	0.25	0.25	0.25	7.91%	0.27	0.27	0.27	0.27	2.60%	10.407%
											Average DCF	[redacted]

710

711

712 **III. DR. MAKHOLM'S ATTEMPT TO INFLUENCE THE COMMISSION WITH**
713 **OTHER APPROVED RETURNS SHOULD BE REJECTED.**
714
715 **Q. DOES DR. MAKHOLM'S REVIEW OF OTHER STATE COMMISSION COST**
716 **OF EQUITY DECISIONS (NICOR EX. 10.16) HAVE ANY RELEVENCE IN**
717 **THIS PROCEEDING?**
718
719 A. No. Such comparisons add little value to this proceeding. The Commission's task is to
720 set rates for Nicor based on the specific risks facing the Company. The Commission
721 addressed a similar issue in its recent Order in the Peoples Gas rate case:

722 > At several places in their evidence and briefs, the Utilities compare
723 > the ROE's recommended here with the ROEs approved in previous
724 > cases by this and other commissions. E.g., NS-PGL Ex. PRM-2.0
725 > at 3-6. They assert that previously approved ROEs serve as
726 > "guideposts" for our analysis in these cases and insist that they
727 > "are not arguing that their returns should be based on the
728 > authorized returns of other utilities." NS-PGL BOE at 25. The

Commission doubts that the Utilities' return comparisons were offered without the expectation that our decision-making would be affected by them. The Utilities are presumably reluctant to directly press for comparison-based ratemaking because of our previous rejection of that approach. In Commonwealth Edison's most recent rate case, we said:

> ComEd asserts its cost of equity should reflect the costs of equity recently approved for electric utilities in the United States. The cost of equity appropriate to ComEd, however, is specific to that utility. ComEd may not simply adopt the cost of equity set for other utilities scattered around the country, for which the factors and circumstances are not necessarily similar. Rather, pursuant to Section 9-201 of the Act, ComEd must prove that its proposed cost of equity is just and reasonable. Commonwealth Edison, Docket. No. 05-0597, Order, at 153 (June 6, 2006).

Commission Final Oder in Docket No. 07-0242 at 89-90.

IV. COST OF EQUITY RESULTS FOR NICOR

Q. WHAT IS THE APPORPRIATE COST OF EQUITY FOR NICOR?

A. The Commission should rely primarily on the DCF analysis to determine the cost of equity capital for the Company. My testimony demonstrates that the appropriate cost of equity capital is not more than 9.455%. This estimate is based upon the inputs and methodology selected by Dr. Makholm, with certain unsupported and unnecessary adjustments removed as I have discussed in this testimony.

V. COST OF CAPITAL

Q. WHAT IS THE COST OF CAPITAL?

A. The cost of capital, also referred to as the weighted average cost of capital, is the cost of the capital that companies have invested in their business. Companies generally raise capital in two different ways: (1) they sell stock to investors, or (2) they borrow money. The cost of capital is the return on investment that companies need to receive to both repay what they borrowed and to compensate shareholders for their investment. There are two components: the return on debt, which is typically computed using the embedded cost of debt, and the return on equity, which is discussed above. Using the capital structure and cost of debt proposed by Nicor witness Mr. Ruschau, the weighted average cost of capital for the Company is 8.31%:

	Amount ($000)	Weight	Cost	Weighted Cost
Long-term Debt	498,452	43.11%	6.800%	2.93%
Non-redeemable Preferred Stock	1,401	0.12%	4.770%	0.01%
Common Equity	656,406	56.77%	9.455%	5.37%
	1,156,259	100.00%		
			WACC	**8.31%**

Data from CUB Ex. 1.0 and Nicor Ex. 9.2

VI. THE EFFECT OF NICOR'S PROPOSED RIDER ON THE COST OF EQUITY

Q. NICOR HAS PROPOSED SEVERAL NEW RIDERS AS PART OF ITS FILINGS. ARE YOU FAMILIAR WITH THESE RIDERS?

A. Generally, yes. The Company has proposed five different riders. These riders deal with specific business and operational circumstances faced by the Company. Company

Witness Mr. O'Connor describes the riders at pages 3 and 4 of his Direct Testimony, Nicor Ex. 12.0:

> **Uncollectible Expense:** Rider 26, Uncollectible Expense Adjustment ("Rider UEA"), provides for timely recovery of the volatile and significant cost associated with bad debt;
>
> **Natural Gas Used by Nicor Gas:** Rider 27, Company Use Adjustment ("Rider CUA"), provides for timely recovery of the volatile and significant effects of gas price changes in the cost of natural gas used by the Company in the normal course of its business operations;
>
> **Volume Balancing Adjustment:** Rider 28, Volume Balancing Adjustment ("Rider VBA"), provides the Company the opportunity to maintain allowed revenues per customer sufficient to recover its fixed costs as approved in this proceeding, despite changes in customer usage from year to year;
>
> **Energy Efficiency Plan Expenses:** Rider 29, Energy Efficiency Plan ("Rider EEP"), provides for the timely recovery of costs associated with creating and implementing an energy efficiency plan; and
>
> **Accelerated Infrastructure Replacement Program:** Rider 30, Qualifying Infrastructure Plant ("Rider QIP"), provides for the recovery of the cost of and the return on investment arising from the Company's program to accelerate the replacement of cast iron main and copper services.

Q. WOULD ANY OF THE PROPOSED RIDERS HAVE AN IMPACT ON THE COMPANY'S CAPITAL COSTS IF THEY ARE APPROVED IN THIS DOCKET?

A. Yes. Riders UES, CUA, VBA, and QIP will all have favorable impacts of the Company's future revenues and income levels while reducing existing levels of operating risk arising from regulatory lag. Specifically,

> **Riders UES, and CUA** will improve the company's opportunity to earn a return by limiting exposure to the fluctuating cost of natural gas.

Rider VBA will protect the company from deviations in sales due to fluctuations in normal weather conditions and reduced customer demand.

Rider QIP limits regulatory lag and allows the company to earn returns on certain new infrastructure between general rate cases.

Q. WHAT ARE THE BENEFITS TO THE COMPANY AND ITS SHAREHOLDERS IF RIDERS UES, CUA, AND VBA ARE APPROVED?

A. All three of these riders significantly reduce the Companies' cash flow variability, and reduce overall operating risk that arises from regulatory lag, or the timing between changes in a Companies' operating income and the inclusion of those items in rate base or revenue requirement.

Riders UES and CUA minimize the Company's exposure to revenue fluctuations due to changes in the price of natural gas. By tracking uncollectible expense, Rider UES, and company use gas, Rider CUA, the riders limit revenue volatility and provide revenue stability as gas prices change.

Rider VBA minimizes shareholder risk due to future reductions in customer demand caused by weather, and declining per customer usage. By tracking revenues on a per customer basis, this Rider limits revenue volatility and provides revenue stability.

Q. DO THE BENEFITS YOU DESCRIBED ABOVE ACCRUE TO THE UTILITIES' SHAREHOLDERS?

A. Yes. The benefits of Riders UES, CUA, and VBA noted above accrue directly to the Company's common equity shareholders. Equity holders are exposed to more cash flow risk than debt holders because public utility debt holders are paid first out of the company's earnings. The remaining earnings accrue to shareholders through growth from retained earnings and cash flows from dividends. Because these Riders provide revenue stability, the value of this stability accrues directly to equity shareholders.

Q. HAS THE COMPANY'S COST OF CAPITAL PROPOSAL ACCOUNTED FOR THE VALUE OF THIS REDUCTION IN RISK?

A. No, it has not.

Q. HAS THE COMMISSION RECOGNIZED THE VALUE OF SIMILAR RIDERS IN PREVIOUS CASES?

A. Yes. In its recent Final Order in the Peoples Gas rate case, the Commission, in addressing a rider much like Nicor's proposed Rider VBA, stated:

> The Commission finds that Rider VBA will lessen the Utilities' risk associated with their cash flow. Moreover, we agree with Staff's recommendation that there should be a downward adjustment to the cost of common equity to account for the reduced risk associated with the accepted riders. Staff Ex. 10.0 at 23. ...
>
> ******
>
> Overall, we find the record to support a downward adjustment, and in the absence of an exact calculation we find it reasonable to reduce the return on common equity by ten (10) basis points for the duration of the pilot program.

Commission Final Order 07-0242 at 99 (truncated).

Q. WOULD A TEN (10) BASIS POINT REDUCTION IN THE COST OF EQUITY ACCURATELY REFLECT THE VALUE TO SHAREHOLDERS OF THE COMPANY'S RIDERS UES, CUA, AND VBA?

A. No. The actual value of these Riders to Nicor's investors is much greater. The following chart demonstrates the impact that Riders CUA, UEA, and VBA would have had on Nicor's return on equity had they been in place from 1998 and 2007. As this chart demonstrates, the impact of the riders during the time period would have been to increase Nicor's total ROE by between 96 and 391 basis points, with an average impact of 242 basis points.

893

Changes in Operating Income Estimated by Nicor

Year	Rider CUA (1)	Rider UEA (2)	Rate 1 Rider VBA (3)	Sum	Approved Net Income to Shareholders (4)	Implied ROE (5)	Rider Impact on ROE (6)
1998	(533,088)	1,900,000	9,057,000	10,423,912	73,079,199	9.01%	1.50%
1999	(212,897)	1,389,000	5,484,000	6,660,103	73,079,199	9.55%	0.96%
2000	61,811	4,290,000	3,443,000	7,794,811	73,079,199	9.39%	1.12%
2001	832,161	8,307,000	8,175,000	17,314,161	73,079,199	8.02%	2.49%
2002	(317,246)	9,803,000	4,622,000	14,107,754	73,079,199	8.48%	2.03%
2003	2,003,185	12,228,000	5,006,000	19,237,185	73,079,199	7.74%	2.77%
2004	1,740,525	13,872,000	8,116,000	23,728,525	73,079,199	7.10%	3.41%
2005	4,302,326	15,292,000	7,611,000	27,205,326	73,079,199	6.60%	3.91%
2006	10,745,527	-	9,604,000	20,349,527	73,079,199	7.58%	2.93%
2007	3,714,469	7,423,000	10,444,000	21,581,469	73,079,199	7.41%	3.10%
Average	2,233,677	7,450,400	7,156,200	16,840,277	73,079,199		2.42%

Notes

(1) Nicor's response to Staff SK 2.03 Supplemental Ex. 1

(2) Nicor's response to Staff SK 2.02 Exhibit 1

(3) Nicor's response to Staff DR SK 2.01 Exhibit 1

(4) Net income to Shareholders approved in Docket No. 04-0779
'=(cost of equity * % of equity in capital structure) * approved ratebase

(5) (Approved net income less estimated effect of riders) /
(% of equity in capital structure * approved rate base)

(6) 04-0779 approved ROE less implied ROE

894

895 The future is uncertain, and in this instance, estimates of past performance are not a clear

896 indication of what might happen if the Commission approves the Company's proposed

Riders. However, the data provided by the Company does clearly indicate that the Riders have significant value to Nicor's investors.

Q. WHAT DO YOU RECOMMEND?

A. It is clear that the value of Riders CUA, UEA, and VBA to Nicor's shareholders is much greater than the arbitrary 10 basis points the Commission granted in the Peoples case. In order to recognize the significant value of these Riders, if adopted, I propose that the Commission make certain adjustments to the Company's ROE. I believe that it is reasonable, albeit extremely conservative, to estimate the impact that these rider will have on future net income at slightly less than 25% of the impact that they would have had, if they were in place during the previous decade. Overall this results in a total reduction in ROE of 58 basis points. This recommendation should apply to each rider as follows:

> **Rider VBA** The Commission should increase is previously approved adjustment to 25 basis points for Rider VBA.
>
> If **Rider UEA** been in effect during the 1998 to 2007 time period it would have had a similar, but somewhat larger effect than Rider VBA, on average. Accordingly the Commission should approve an equivalent adjustment for each rider. In this case, I am recommending 25 basis points for each rider.
>
> **Rider CUA** would have had a smaller impact on the Company's revenues, however it would still have provided significant certainty to shareholders. Accordingly I recommend that the Commission approve an adjustment for Rider CUA proportionate to its impact on the Company's revenues, in this case, 8 basis points ($2.2 million / $7.2 million)*25 basis points = 7.6 basis points].

If the Commission approves these three riders it should adjust the Company's ROE by not less that 58 basis points to recognize the value that these riders have to the Company.

Q. THE COMPANY HAS PROPOSED TO DROP RIDER VBA IF THE COMMISSION INCREASES THE CUSTOMER CHARGE AND MOVES TOWARDS A STRAIGHT FIXED VARIABLE RATE DESIGN. NICOR EX. 12.0 AT 25. WOULD SUCH A PROPOSAL HAVE SIMILAR BENEFITS TO THE COMPANY?

A. Yes. Increasing the proportion of delivery charges that are recovered through fixed charges, a method commonly referred to as a straight fixed variable rate design, would provide a significant amount of revenue stability to the Company. Nicor recognizes this and has testified that "Nicor Gas would be supportive of a Commission order that would implement a SFV rate design in lieu of Nicor Gas' proposed Rider VBA." Nicor Ex. 12.0 at 25. If the commission rejects Nicor's proposed Rider VBA and instead approves an increase to the customer charge, it should adopt a 25 basis point adjustment to the cost of equity as I have proposed.

Q. WHAT IMPACT WILL RIDER QIP HAVE ON NICOR'S CAPITAL COSTS, AND HOW CAN THE COMMISSION ADJUST FOR THAT BENEFIT IN SETTING RATES?

A. Nicor will face significantly reduced risk when investing capital to replace existing cast iron and copper mains because of the cost recovery guarantee implicit in the Rider. This risk reduction is significant because it protects investors from the possibility that they will fail to recover their investment. As a result, I recommend that if Rider QIP is approved, the Company receive a cost of capital on any investment made under Rider QIP that is equivalent to its embedded cost of long-term debt, for which the Company has proposed 6.80%. This return will allow the Company access to the capital it needs to finance projects under QIP, while recognizing the dramatically reduced risk of recovery for projects financed through the rider. This recommendation to limit the cost of capital

on Rider QIP investments is conservative and the Commission may find that other, additional measures are necessary.

VII. SUMMARY AND CONCLUSION

Q. PLEASE SUMMARIZE YOUR FINDINGS.

A. My testimony demonstrates that Nicor should be granted a return on common equity of no more than 9.455%. In addition, if the Commission approves the cost recovery riders proposed by the Company it should make corresponding adjustments to the cost of capital as shown below:

Rider CUA – 8 basis points

Rider VBA – 25 basis points

Rider UEA – 25 basis points

Rider QIP – Cost of equity on all Rider QIP projects of 6.80%

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

STATE OF ILLINOIS
ILLINOIS COMMERCE COMMISSION

Northern Illinois Gas Company	)	
d/b/a Nicor Gas Company	)	**08-0363**
	)	
Proposed general increase in natural gas rates.	)	

VERIFICATION OF THE CITIZENS UTILITY BOARD'S DIRECT TESTIMONY

I, Christopher C. Thomas, Director of Policy for the Citizens Utility Board, deposes and states that, as required by Illinois Supreme Court Rules 213 and 214, CUB Exhibit 1.0, my Direct Testimony, together with any and all attachments, are, to the best of my knowledge, true, correct and complete in accordance with the rules.

Christopher C. Thomas
Director of Policy
CITIZENS UTILITY BOARD

Notarized this 27th day of August, 2008.

Notary Public

OFFICIAL SEAL
JACQUELINE BRADFORD SCARVER
NOTARY PUBLIC - STATE OF ILLINOIS
MY COMMISSION EXPIRES:10/05/10

Docket Summary for Christopher C. Thomas

Illinois Commerce Commission Docket No. 07-0585
Central Illinois Light Company, d/b/a Ameren CILCO; Central Illinois Public Service Company, d/b/a Illinois Public Service Company, d/b/a Ameren CIPS; and Illinois Power Company, d/b/a AmerenIP, Proposed general increase in rates for delivery
On Behalf of: The Citizens Utility Board

Illinois Commerce Commission Docket No. 07-0566
Commonwealth Edison Company, Proposed General Increase in Electric Rates
On Behalf of: The Citizens Utility Board

Illinois Commerce Commission Docket No.07-0507
Illinois-American Water Company, Proposed General Increase in Water and Sewer Rates
On Behalf of: The Citizens Utility Board

Illinois Commerce Commission Docket No.07-0540
Commonwealth Edison Company, Approval of the Energy Efficiency and Demand-Response Plan.
On Behalf of: The Citizens Utility Board

Illinois Commerce Commission Docket No.07-0539
Central Illinois Light Company, d/b/a Ameren CILCO; Central Illinois Public Service Company, d/b/a Illinois Public Service Company, d/b/a Ameren CIPS; and Illinois Power Company, d/b/a AmerenIP, Approval of the Energy Efficiency and Demand-Response Plan.
On Behalf of: The Citizens Utility Board

Illinois Commerce Commission Docket No.07-0528
Commonwealth Edison Company, Petition for Approval of Initial Procurement Plan
On Behalf of: The Citizens Utility Board

Illinois Commerce Commission Docket No.07-0527
Central Illinois Light Company, d/b/a Ameren CILCO; Central Illinois Public Service Company, d/b/a Illinois Public Service Company, d/b/a Ameren CIPS; and Illinois Power Company, d/b/a AmerenIP, Petition for Approval of Initial Procurement Plan
On Behalf of: The Citizens Utility Board

Illinois Commerce Commission Docket No.07-0242 (cons.)
North Shore Gas Company and Peoples Gas Light and Coke Company Proposed general increase in natural gas rates
On Behalf of: The Citizens Utility Board and the City of Chicago

Docket Summary for Christopher C. Thomas

Illinois Commerce Commission Docket No.07-0166
Commonwealth Edison Company Investigation pursuant to Section 9-250 of the Public Utilities Act of Rate Design
On Behalf of: The Citizens Utility Board

Illinois Commerce Commission Docket No.07-0165
Central Illinois Light Company, d/b/a Ameren CILCO; Central Illinois Public Service Company, d/b/a Illinois Public Service Company, d/b/a Ameren CIPS; and Illinois Power Company, d/b/a AmerenIP Investigation pursuant to Section 9-250 of the Public Utilities Act of Electric Rate Design
On Behalf of: The Citizens Utility Board

Illinois Commerce Commission Docket No.06-0800
Investigation of Rider CPP of Commonwealth Edison Company, and Rider MV of Central Illinois Light Company d/b/a AmerenCILCO, of Central Illinois Public Service Company d/b/a AmerenCIPS, and of Illinois Power Company d/b/a AmerenIP, pursuant to Commission Orders regarding the Illinois Auction
On Behalf of: The Citizens Utility Board

Illinois Commerce Commission Docket No. 06-0691 (cons.)
Central Illinois Light Company d/b/a AmerenCILCO, Central Illinois Public Service Company, d/b/a Ameren CIPS, Illinois Power Company d/b/a AmerenIP, Proposal to establish a new rider entitled Rider PRP – Price Response Program, (tariffs filed September 29, 2006)
On Behalf of: The Citizens Utility Board

Illinois Commerce Commission Docket No. 06-0617
Commonwealth Edison Company Proposed Revisions to Rate BES-H Basic Electric Service Hourly Energy Pricing
On Behalf of: The Citizens Utility Board and The City of Chicago

Illinois Commerce Commission Docket No. 06-0379
Citizen's Utility Board And the People of the State of Illinois Petition To Initiate Rulemaking With Notice and Comment for Approval of Certain Amendments to Illinois Administrative Code Part 280.
On Behalf of: The Citizens Utility Board

Illinois Commerce Commission Docket No. 06-0270
COMMONWEALTH EDISON COMPANY Petition of Commonwealth Edison Company For Approval Pursuant to Section 7-102 of the Public Utilities Act of the Entry into Certain Contracts Relating to Wind Generation and Approval Under Section 9-201

Docket Summary for Christopher C. Thomas

of a Tariff Concerning the Governor's Sustainable Energy Plan and the Illinois Commerce Commission's Resolution in Docket No. 05-0437.

On Behalf of: The Citizens Utility Board

Illinois Commerce Commission Docket No. 06-0070 (cons.)
CENTRAL ILLINOIS LIGHT COMPANY, d/b/a Ameren CILCO, CENTRAL ILLINOIS PUBLIC SERVICES COMPANY, d/b/a AmerenCIPS, and ILLINOIS POWER COMPANY, d/b/a AmerenIP Proposed General Increase For Delivery Services

On Behalf of: The Citizens Utility Board

Illinois Commerce Commission Docket No. 06-0027
Illinois Commerce Commission Vs. Illinois Bell Telephone Company - Investigation of specified tariffs declaring certain services to be competitive Telecommunications services.

On Behalf of: The Citizens Utility Board

Illinois Commerce Commission Docket No. 05-0597
Commonwealth Edison Company Proposed general increase in electric rates, general restructuring of rates, price unbundling of bundled service rates, and revision of other terms and conditions of service.

Testimony On Behalf of: The Citizens Utility Board and The City of Chicago

Illinois Commerce Commission Docket No. 04-0779
Nicor Inc. Proposed General Increase in Rates

Testimony On Behalf of: The Citizens Utility Board and the Cook County States Attorney

Illinois Commerce Commission Docket No. 04-0476
Illinois Power Company and Ameren Corp Proposed General Increase in Gas Rates

On Behalf of: The Citizens Utility Board

Missouri Public Service Commission Docket No. TR-2002-251
In the Matter of the Tariffs Filed by Sprint Missouri, Inc., d/b/a Sprint, to Reduce the Basic Rates by the Change in the CPI-TS as Required by Section 392.245(4), Updating Its Maximum Allowable Prices for Non-basic Services and Adjusting Certain Rates as Allowed by Section 392.245(11), and Reducing Certain Switched Access Rates and Rebalancing to Local Rates, as Allowed by Section 392.245(9) (Affidavit)

On Behalf of: Staff of the Missouri Public Service Commission

Docket Summary for Christopher C. Thomas

Missouri Public Service Commission Docket No. TO-2004-0207
In the Matter of a Commission Inquiry into the Possibility of Impairment without Unbundled Local Circuit Switching When Serving the Mass Market
On Behalf of: Staff of the Missouri Public Service Commission

Missouri Public Service Commission Docket No. IT-2004-0015
In the Matter of Southwestern Bell Telephone Company, d/b/a SBC Missouri's Proposed Revised Tariff Sheet Intended to Increase by Eight Percent the Rates for Line Status Verification and Busy Line Interrupt as Authorized by Section 392.245, RSMo, the Price Cap Statute
On Behalf of: Staff of the Missouri Public Service Commission

Missouri Public Service Commission Docket No. TT-2002-472/473
In the Matter of Southwestern Bell Telephone Company's Tariff Filing to Initiate Residential Customer Winback Promotion / In the Matter of Southwestern Bell Telephone Company's Tariff Filing to Extend Business Customer Winback Promotions
On Behalf of: Staff of the Missouri Public Service Commission

Missouri Public Service Commission Docket No. TO-2002-222
In the Matter of the Petition of MClmetro Access Transmission Services LLC, Brooks Fiber Communications of Missouri, Inc., and MCI WorldCom Communications, Inc., for Arbitration of an Interconnection Agreement With Southwestern Bell Telephone Company Under the Telecommunications Act of 1996.
On Behalf of: Staff of the Missouri Public Service Commission

Missouri Public Service Commission Docket No. TA-2001-475/TA-99-47
In the Matter of the Application of Southwestern Bell Communications Services, Inc., d/b/a SBC Long Distance, for a Certificate of Service Authority to Provide Interexchange Telecommunications Services within the State of Missouri / In the Matter of the Application of Southwestern Bell Communications Services, Inc., d/b/a Southwestern Bell Long-distance, for a Certificate of Service Authority to Provide Interexchange Telecommunications Services within the State of Missouri.
On Behalf of: Staff of the Missouri Public Service Commission

Missouri Public Service Commission Docket No. TO-2001-455
In the Matter of the Application of AT&T Communications of the Southwest, Inc., TCG St. Louis, Inc., and TCG Kansas City, Inc., for Compulsory Arbitration of Unresolved Issues With Southwestern Bell Telephone Company pursuant to Section 252(b) of the Telecommunications Act of 1996
On Behalf of: Staff of the Missouri Public Service Commission

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Missouri Public Service Commission Docket No. TO-2001-439
In the Matter of the Determining of Prices, Terms and Conditions of Conditioning for xDSL-capable Loops
On Behalf of: Staff of the Missouri Public Service Commission

Missouri Public Service Commission Docket No. TT-2001-298
In the Matter of Southwestern Bell Telephone Company's Proposed Tariff PSC Mo. No. 42 Local Access Service Tariff, Regarding Physical and Virtual Collocation
On Behalf of: Staff of the Missouri Public Service Commission

Missouri Public Service Commission Docket No. TT-2000-527/513
In the Matter of the Application of Allegiance Telecom of Missouri, Inc., CCMO, Inc. d/b/a Connect!, DSLnet Communications, LLC, KMC Telecom III, Inc. and New Edge Network, Inc. for an Order Requiring Southwestern Bell Telephone Company to File a Collocation Tariff / In the Matter of the Joint Petition of Birch Telecom of Missouri, Inc. for a Generic Proceeding to Establish a Southwestern Bell Telephone Company Collocation Tariff Before the Missouri Public Service Commission
On Behalf of: Staff of the Missouri Public Service Commission

Missouri Public Service Commission Docket No. TO-98-329 In the Matter of an Investigation into Various Issues Related to the Missouri Universal Service Fund
On Behalf of: Staff of the Missouri Public Service Commission